

CLAIMS

What is claimed is:

1 1. A coordinated push synchronization method, comprising the acts
2 of:
3 detecting changes to a local application data store;
4 identifying a record affected by a detected change;
5 pushing the identified record;
6 ascertaining whether the identified record, in its current form as affected
7 by the detected change, has been replicated or deleted in a remote application
8 data store through user-initiated synchronization; and
9 if not, updating the remote application data store with the pushed record.

1 2. The method of Claim 1, wherein the act of ascertaining includes
2 comparing a local change counter associated with pushed record with a remote
3 change counter, where values for the local and remote change counters are
4 equal the identified record, in its current form, has been replicated or deleted
5 through user-initiated synchronization.

1 3. The method of Claim 1, wherein the act of pushing the identified
2 record comprises:

3 if the identified record has been detected as being new, pushing a replica
4 of the identified record with instructions to save the replica in the remote
5 application data store;

6 if the identified record has been detected as being modified, pushing a
7 replica of the identified record with instructions to save the replica in the remote
8 application data store replacing a prior version of the record; and

9 if the identified record has been detected as being deleted, pushing
10 instructions to delete a prior version of the identified contained in the remote
11 application data store.

1 4. The method of Claim 1, further comprising, after updating the
2 remote application data store, setting a coordination flag for the pushed record.

1 5. A coordinated user-initiated synchronization method, comprising
2 the acts of:

3 detecting changes to a local application data store;
4 identifying a record affected by a detected change;
5 ascertaining whether the identified record, in its current form as affected
6 by the detected change, has been replicated in or deleted from a remote
7 application data store through push synchronization; and
8 if not, synchronizing the remote application data store with the local
9 application data store.

1 6. The method of Claim 5, wherein the act of ascertaining includes
2 examining a coordination flag associated with the identified record, a set
3 coordination flag indicating that the identified record, in its current form, has
4 been replicated in or deleted from the remote application data store through
5 push synchronization and a reset coordination flag indicating that the identified
6 record, in its current form, has not.

1 7. The method of Claim 5, wherein the act of synchronizing
2 comprises:

3 if the identified record has been detected as being new, replicating the
4 identified record in the remote application data store;
5 if the identified record has been detected as being modified, replicating
6 the identified record in the remote application data store replacing a prior version
7 of the record; and
8 if the identified record has been detected as being deleted, deleting the
9 version of the identified record from the remote application data store.

1 8. The method of Claim 5, further comprising the act of altering a
2 local change counter associated with a record affected by a detected change,
3 and wherein the act of identifying comprises comparing a global change counter

4 associated with the affected record with the local change counter associated
5 with the affected record.

1 9. The method of Claim 5, further comprising the acts of updating a
2 value of a global change counter associated with the identified record to equal
3 the value of a local change counter associated with the identified record, and
4 resetting a coordination flag associated with the identified record.

1 10. A coordinated push and user-initiated synchronization method,
2 comprising:

3 detecting changes to a local application data store;
4 identifying a record affected by a detected change;
5 if the identified record is pushed, ascertaining whether the identified
6 record, in its current form as affected by the detected change, has been
7 replicated in or deleted from a remote application data store through user-
8 initiated synchronization and, if not, updating the remote application data store
9 with the pushed record; and

10 if a user initiates synchronization, ascertaining whether the identified
11 record, in its current form as affected by the detected change, has been
12 replicated in or deleted from the remote application data store through push
13 synchronization and, if not, synchronizing the remote application data store with
14 the local application data store.

1 11. The method of Claim 10, wherein the act of ascertaining whether
2 the identified record has been replicated in or deleted from a remote application
3 data store through user-initiated synchronization includes comparing a local
4 change counter associated with the identified record with a remote change
5 counter, the identified record, in its current form, has been replicated or deleted
6 through user-initiated synchronization where values for the local and remote
7 change counters are equal.

1 12. The method of Claim 10, wherein the act of ascertaining whether
2 the identified record has been replicated in or deleted from the remote application

3 data store through push synchronization includes examining a coordination flag
4 associated with the identified record, a set coordination flag indicating that the
5 identified record, in its current form, has been replicated in or deleted from the
6 remote application data store through push synchronization and a reset
7 coordination flag indicating that the identified record, in its current form, has
8 not.

1 13. The method of Claim 10, wherein the act of updating the remote
2 application data store with the pushed record comprises:

3 if the pushed record has been detected as being new, replicating the
4 pushed record in the remote application data store;
5 if the pushed record has been detected as being modified, replicating the
6 pushed record in the remote application data store replacing a prior version of
7 the pushed record contained in the remote application data store; and
8 if the pushed record has been detected as being deleted, deleting a prior
9 version of the pushed record contained in the remote application data store.

1 14. The method of Claim 10, wherein the act of synchronizing the
2 remote application data store with the local application data store comprises:

3 if the identified record has been detected as being new, replicating the
4 identified record in the remote application data store;
5 if the identified record has been detected as being modified, replicating
6 the identified record in the remote application data store replacing a prior version
7 of the record; and
8 if the identified record has been detected as being deleted, deleting the
9 version of the identified record from the remote application data store.

1 15. The method of Claim 10, further comprising, after updating the
2 remote application data store with the pushed record, setting a coordination flag
3 associated with the pushed record.

1 16. The method of Claim 10, further comprising, after synchronizing
2 the remote application data store with the local application data store is

3 completed, updating a value of a global change counter associated with the
4 identified record to equal the value of a local change counter associated with the
5 identified record, and resetting a coordination flag associated with the identified
6 record.

1 17. A coordinated push synchronization computer program product
2 comprising a computer useable medium having computer readable instructions
3 thereon for:

4 detecting changes to a local application data store;
5 identifying a record affected by a detected change;
6 pushing the identified record;
7 ascertaining whether the identified record, in its current form as affected
8 by the detected change, has been replicated or deleted in a remote application
9 data store through user-initiated synchronization; and
10 if not, updating the remote application data store with the pushed record.

1 18. The product of Claim 17, wherein the instructions for ascertaining
2 include instructions for comparing a local change counter associated with the
3 identified record with a remote change counter, where values for the local and
4 remote change counters are equal the identified record, in its current form, has
5 been replicated or deleted through user-initiated synchronization.

1 19. The product of Claim 17, wherein the instructions for pushing the
2 identified record comprise instructions for:

3 if the identified record has been detected as being new, pushing a replica
4 of the identified record with instructions to save the replica in the remote
5 application data store;

6 if the identified record has been detected as being modified, pushing a
7 replica of the identified record with instructions to save the replica in the remote
8 application data store replacing a prior version of the record; and

9 if the identified record has been detected as being deleted, pushing
10 instructions to delete a prior version of the identified contained in the remote
11 application data store.

1 20. The product of Claim 17, further comprising instructions for, after
2 updating the remote application data store with the pushed record, setting a
3 coordination flag for the pushed record.

1 21. A coordinated user-initiated synchronization computer program
2 product comprising a computer useable medium having computer readable
3 instructions thereon for:

4 detecting changes to a local application data store;
5 identifying a record affected by a detected change;
6 ascertaining whether the identified record, in its current form as affected
7 by the detected change, has been replicated in or deleted from a remote
8 application data store through push synchronization; and
9 if not, synchronizing the remote application data store with the local
0 application data store.

1 22. The product of Claim 21, wherein the instructions for ascertaining
2 include instructions for examining a coordination flag associated with the
3 identified record, a set coordination flag indicating that the identified record, in
4 its current form, has been replicated in or deleted from the remote application
5 data store through push synchronization and a reset coordination flag indicating
6 that the identified record, in its current form, has not.

- 1 23. The product of Claim 21, wherein the instructions for
- 2 synchronizing comprise instructions for:
 - 3 if the identified record has been detected as being new, replicating the
 - 4 identified record in the remote application data store;
 - 5 if the identified record has been detected as being modified, replicating
 - 6 the identified record in the remote application data store replacing a prior version
 - 7 of the record; and
 - 8 if the identified record has been detected as being deleted, deleting the
 - 9 version of the identified record from the remote application data store.

1 24. The product of Claim 21, further comprising instructions for
2 altering a local change counter associated with a record affected by a detected
3 change, and wherein the instructions for identifying comprise instructions for
4 comparing a global change counter associated with the affected record with the
5 local change counter associated with the affected record.

1 25. The product of Claim 21, further comprising instructions for
2 updating a value of a global change counter associated with the identified record
3 to equal the value of a local change counter associated with the identified
4 record, and resetting a coordination flag associated with the identified record.

1 26. A coordinated push and user-initiated synchronization computer
2 program product comprising a computer useable medium having computer
3 readable instructions thereon for:
4 detecting changes to a local application data store;
5 identifying a record affected by a detected change;
6 if the identified record is pushed, ascertaining whether the identified
7 record, in its current form as affected by the detected change, has been
8 replicated in or deleted from a remote application data store through user-
9 initiated synchronization and, if not, updating the remote application data store
10 with the pushed record; and
11 if a user initiates synchronization, ascertaining whether the identified
12 record, in its current form as affected by the detected change, has been
13 replicated in or deleted from the remote application data store through push
14 synchronization and, if not, synchronizing the remote application data store with
15 the local application data store.

1 27. The product of Claim 26, wherein the instructions for ascertaining
2 whether the identified record has been replicated in or deleted from a remote
3 application data store through user-initiated synchronization include instructions
4 for comparing a local change counter associated with the identified record with
5 a remote change counter, the identified record, in its current form, has been

6 replicated or deleted through user-initiated synchronization where values for the
7 local and remote change counters are equal.

1 28. The product of Claim 26, wherein the instructions for ascertaining
2 whether the identified record has been replicated in or deleted from the remote
3 application data store through push synchronization include instructions for
4 examining a coordination flag associated with the identified record, a set
5 coordination flag indicating that the identified record, in its current form, has
6 been replicated in or deleted from the remote application data store through
7 push synchronization, a reset coordination flag indicating that the identified
8 record, in its current form, has not.

1 29. The product of Claim 26, wherein the instructions for updating the
2 remote application data store with the pushed record comprise instructions for:
3 if the pushed record has been detected as being new, replicating the
4 pushed record in the remote application data store;
5 if the pushed record has been detected as being modified, replicating the
6 pushed record in the remote application data store replacing a prior version of
7 the record; and
8 if the pushed record has been detected as being deleted, deleting a prior
9 version of the identified record contained in the remote application data store.

1 30. The product of Claim 26, wherein the instructions for
2 synchronizing the remote application data store with the local application data
3 store comprise instructions for:
4 if the identified record has been detected as being new, replicating the
5 identified record in the remote application data store;
6 if the identified record has been detected as being modified, replicating
7 the identified record in the remote application data store replacing a prior version
8 of the record; and
9 if the identified record has been detected as being deleted, deleting the
10 version of the identified record from the remote application data store.

1 31. The product of Claim 26, further comprising instructions for, after
2 updating the remote application data store with the pushed record, setting a
3 coordination flag associated with the identified record.

1 32. The product of Claim 26, further comprising instructions for, after
2 synchronizing the remote application data store with the local application data
3 store have been executed, updating a value of a global change counter
4 associated with the identified record to equal the value of a local change counter
5 associated with the identified record, and resetting a coordination flag
6 associated with the identified record.

1 33. A coordinated push synchronization system, comprising a push
2 module and a reception module, the push operable to push a record and a local
3 change counter associated with the record to the reception module, the
4 reception module operable to compare the pushed local change counter with a
5 remote change counter and to update a remote application data store with the
6 pushed record based upon the comparison.

1 34. The system of Claim 33, wherein the local and remote change
2 counters each have a value and the reception module is operable to compare
3 those values and update the remote application data store only if the values are
4 not equal.

1 35. The system of Claim 33, wherein the record is associated with a
2 coordination flag, and wherein the push module is further operable to set the
3 coordination flag upon updating the remote application data store with the
4 pushed record.

1 36. A coordinated user-initiated synchronization system, comprising a
2 synch module in communication with a synch engine, the synch module
3 operable to detect the creation, modification, or deletion of or to a record and to
4 modify a change counter according to the detection, the synch engine operable
5 to examine the change counter and a coordination flag associated with the

6 record and to issue instructions to replicate or delete the record on a remote
7 system based upon the examination.

1 37. The system of Claim 36, wherein the coordination flag has a status
2 set or reset and wherein the synch engine is further operable to issue
3 instructions to replicate or delete the record on the remote system only if the
4 coordination flag is reset.

1 38. The system of Claim 36, wherein the record is associated with a
2 global change counter controlled by the synch engine and a local change counter
3 controlled by the synch module, and wherein the synch engine is further
4 operable to modify a value of the global change counter to equal a value for the
5 local change counter upon issuing instructions to replicate of the record.

1 39. A coordinated push and user initiated synchronization system,
2 comprising:

3 a push module and a reception module, the push module operable to
4 detect the creation, modification, or deletion of a record, and to push the record
5 and a local change counter associated with the record to the reception module,
6 the reception module operable to compare the pushed local change counter with
7 a remote change counter associated with the record and to update a remote
8 application data store using the pushed record based upon the comparison;

9 a synch module operable to detect the creation, modification, or deletion
10 of the record, to modify the local change counter based upon the detection and
11 to reset the coordination flag; and

12 a synch engine in communication the local synch module, the synch
13 engine operable to compare the local change counter with a global change
14 counter associated with the record and to examine the coordination flag and to
15 issue instructions to replicate or delete the record in the remote application data
16 store based upon the comparison and examination.

1 40. The system of Claim 39, wherein the local and remote change
2 counters each have a value and the reception module is operable to compare

3 those values and update the remote application data store only if the values are
4 not equal.

1 41. The system of Claim 36, wherein the coordination flag has a status
2 set or reset, and the synch engine is further operable to issue instructions to
3 replicate or delete the record in the remote application data store only if the
4 coordination flag has a reset status.

1 42. The system of Claim 39, wherein the push module is further
2 operable to set the coordination flag upon updating the remote application data
3 store with the pushed record.

1 43. The system of Claim 36, wherein the synch engine is further
2 operable to modify a value of the global change counter to equal a value for the
3 local and remote change counters upon replication of the record on the remote
4 system.

1 44. A coordinated push and user initiated synchronization system,
2 comprising:

3 a means for detecting the creation, modification, or deletion of a record
4 and pushing the record and a local change counter associated with the record;

5 a means for receiving the pushed record and local change counter,
6 comparing the pushed local change counter with a remote change counter
7 associated with the record, and updating a remote application data store using
8 the pushed record based upon the comparison;

9 a means for detecting the creation, modification, or deletion of the record,
10 modifying the local change counter, and resetting the coordination flag; and

11 a means for comparing the local change counter with a global change
12 counter, examining the coordination flag, and issuing instructions to replicate or
13 delete the record in the remote application data store based upon the
14 comparison and examination.